Improvement of Ultrasonically Assisted Chronic Wound Healing Applicator

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PROBLEM

Chronic wounds affects **6.5 million people** in US

Long healing time + **$25 billion cost** annually

- <u>Current ultrasound applicator device is incapable</u> of **monitoring and recording** patient treatment information

Constraints

1. Existing solution
2. Wearability
3. Budget
4. COVID-19 Policies

Requirements

1. One-click to start treatment
2. Automatic shutoff to end treatment
3. Overtreatment prevention
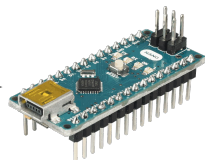4. Patient usage data logging

SOLUTION

Push button
Starts the treatment

Microcontroller
Control Center

Real Time Clock
Records and maintains time

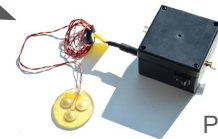**Buzzer**
Alerts user upon completion

SD Card
Starts the timer and saves data

Relay Switch

Ultrasound Healing Applicator
Provides treatment

TESTING

Req.	Verification Result	Pass/Fail
1	**Desired signal** triggered upon start	**Pass** ✓
2	Treatment Duration: **902 ± 1.53 seconds**	**Pass** ✓
3	Allowed one treatment every **21 hours**	**Pass** ✓
4	Timestamp accuracy: **3.25 ± 2.31 seconds**	**Pass** ✓

FUTURE & IMPACT

Impact:
- Improve safety by preventing overtreatment
- Enable patient compliance monitoring

Future Revisions:
- Perform pilot testing, then redesign enclosure to better optimize for at home use